

# ABSTRACT

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Title of Thesis: The influence of the die size on the compaction process

This diploma thesis is focused on exploration the influence of the die size on the compaction process. That was evaluated by parameters of three-exponential equation. Compressibility was studied by using force-displacement record. In this work was also observed an effect of die size on the tensile strength. In processing the experimental part of this work were used four different model materials. Microcrystalline cellulose and dicalcium phosphate are used as model fillers and theophylline and paracetamol as model active substances. Compaction of these materials was carried out in dies of size 7 mm, 9 mm, 11 mm, 13 mm and 15 mm.

The results of the work showed that the die size significantly affects all parameters force-displacement record. With the growing size of the die there was a reduction of energy parameters. Most of the compaction parameters were statistically influenced. Increasing die size caused reducing volume reduction and energy consumption and increased speed of volume reduction at the stage of pre-compression and elastic deformation. At the stage of plastic deformation there was an increase of the volume reduction, power consumption and decreased of speed of volume reduction. The highest tensile strength of the tablets was observed for the microcrystalline cellulose and further decreased in order theophylline, dicalcium phosphate and paracetamol. With the increasing die size and also the flat tablets decreased tablet strength.